IN THE CLAIMS:

Please amend claims 80 and 84-93 and cancel claim 79 according to the following replacement claim set. Claims 58-64 are withdrawn from consideration.

1. (Previously Presented) A rubidium-82 generator, comprising:

a strontium-82 support medium comprising sodium nonatitanate characterized by a strontium/rubidium separation factor greater than 12,500 at an alkaline pH.

2. (Original) The rubidium-82 generator of claim 1, wherein the sodium nonatitanate is characterized by a strontium selectivity greater than 250,000 mL/g at an alkaline pH.

3. (Original) The rubidium-82 generator of claim 1, wherein the sodium nonatitanate is characterized by a rubidium selectivity less than 100 mL/g at an alkaline pH.

4. (Canceled).

5. (Original) The rubidium-82 generator of claim 1, wherein the sodium nonatitanate is characterized by a strontium/rubidium separation factor greater than 100,000.

6. (Original) A process for preparing a rubidium-82 generator, comprising:

(a) preparing sodium nonatitanate from titanium isopropoxide and aqueous sodium hydroxide;

(b) heating the sodium nonatitanate at a temperature between 100°C and 250°C for a period between 12 hours and 2 weeks; and

(c) absorbing strontium-82 on the sodium nonatitanate from an aqueous solution comprising strontium-82 and sodium chloride, wherein the sodium chloride concentration is between 0.1 and 1 molar.

7. (Original) The process of claim 6, wherein the molar ratio of aqueous sodium hydroxide to titanium isopropoxide is in excess of 0.44.

8. (Original) The process of claim 6, wherein the molar ratio of aqueous sodium hydroxide to titanium isopropoxide is between 2 and 6.

9. (Previously Presented) A method of chemically isolating strontium-82 from a proton-irradiated molybdenum target, comprising:

(a) dissolving the molybdenum target containing the strontium-82;

(b) adjusting the pH of the dissolved molybdenum target solution to an alkaline pH;

(c) removing precipitates from the solution; and then

(d) absorbing the strontium-82 from the solution onto a support comprising sodium nonatitanate.

10. (Previously Presented) A process for preparing a solution containing rubidium-82, comprising:

(a) providing a solution containing strontium-82;

(b) absorbing strontium-82 onto a sodium nonatitanate support medium; and

(c) eluting rubidium-82 from the sodium nonatitanate support medium with a solvent.

11. (Original) The process of claim 10, wherein the solvent is selected from the group consisting of water and saline solutions.

12. (Original) The process of claim 10, wherein the solvent is an aqueous solution having a sodium chloride concentration between 0.001 molar and 1 molar.

13. (Original) The process of claim 10, wherein the solvent is an aqueous solution having a sodium chloride concentration between 0.2 molar and 1 molar.

14. (Original) The process of claim 10, wherein the solvent is a pharmaceutical-grade saline and buffer solution.

15. (Original) A method of chemically isolating strontium-82 from a proton-irradiated rubidium or rubidium chloride target, comprising:

(a) dissolving the target containing the strontium-82;

(b) adjusting the pH of the dissolved target solution to an alkaline pH;

(c) removing precipitates from the solution; and then

(d) absorbing the strontium-82 from the solution onto a support comprising sodium nonatitanate without absorbing rubidium.

16. (Previously Presented) The rubidium-82 generator of claim 1, further comprising strontium-82 absorbed on the sodium nonatitanate.

17. (Previously Presented) The rubidium-82 generator of claim 1, further comprising a sodium nonatitanate filter medium disposed to receive effluent from the strontium-82 support medium to trap strontium-82 leached from the generator.

18. (Previously Presented) The rubidium-82 generator of claim 1, further comprising a column, wherein the sodium nonatitanate is disposed in the column.

19. (Previously Presented) The rubidium-82 generator of claim 1, wherein the sodium nonatitanate is characterized by a strontium/rubidium separation factor greater than 59,200.

20. (Previously Presented) The rubidium-82 generator of claim 1, wherein the sodium nonatitanate is characterized by a strontium/rubidium separation factor greater than or equal to 79,500.

21. (Previously Presented) The process of claim 6, wherein the aqueous sodium hydroxide is about 50 wt% sodium hydroxide.

22. (Previously Presented) The process of claim 6, further comprising:

filtering the sodium nonatitanate from the solution.

23. (Previously Presented) The process of claim 22, further comprising:
washing the sodium nonatitanate with ethanol.

24. (Previously Presented) The process of claim 23, further comprising:
drying the sodium nonatitanate.

25. (Previously Presented) The process of claim 6, wherein the molar ratio of aqueous sodium hydroxide to titanium isopropoxide is between 1 and 10.

26. (Previously Presented) The process of claim 6, wherein the sodium nonatitanate is heated in a pressure vessel.

27. (Previously Presented) The process of claim 6, wherein the sodium nonatitanate is prepared in the absence of titanium chlorides and sulfates.

28. (Previously Presented) The method of claim 9, wherein the molybdenum target is dissolved in hydrogen peroxide.

29. (Previously Presented) The method of claim 9, wherein the pH is adjusted with sodium hydroxide.

30. (Previously Presented) The method of claim 9, wherein the pH is adjusted to about 12.

31. (Previously Presented) The method of claim 9, further comprising:
stripping the strontium-82 from the sodium nonatitanate.

32. (Previously Presented) The method of claim 31, wherein the strontium-82 is stripped from the sodium nonatitanate with mineral acid.

33. (Previously Presented) The method of claim 9, further comprising:
washing the sodium nonatitanate with a buffer solution.

34. (Cancelled)

35. (Previously Presented) The method of claim 9, wherein the sodium nonatitanate is characterized by a strontium/rubidium separation factor greater than 12,500.

36. (Previously Presented) The method of claim 9, wherein the sodium nonatitanate is characterized by a strontium/rubidium separation factor greater than or equal to 59,200.

37. (Previously Presented) The method of claim 9, wherein the sodium nonatitanate is characterized by a strontium/rubidium separation factor greater than or equal to 100,000.

38. (Cancelled)

39. (Previously Presented) The process of claim 10, wherein the sodium nonatitanate is characterized by a strontium/rubidium separation factor greater than 12,500.

40. (Previously Presented) The process of claim 10, wherein the sodium nonatitanate is characterized by a strontium/rubidium separation factor greater than or equal to 59,200.

41. (Previously Presented) The process of claim 10, wherein the sodium nonatitanate is characterized by a strontium/rubidium separation factor greater than or equal to 100,000.

42. (cancelled)

43. (Previously Presented) The process of claim 10, further comprising:
disposing the sodium nonatitanate support medium into a column.

44. (Previously Presented) The process of claim 10, wherein the solvent containing the eluted rubidium is alkaline.

45. (Previously Presented) The process of claim 10, further comprising:
buffering the solvent.

46. (cancelled)

47. (Previously Presented) The method of claim 15, wherein the dissolved target solution includes a buffer.

48. (Previously Presented) The method of claim 47, wherein the buffer is an ammonia/ammonium chloride buffer.

49. (Previously Presented) The method of claim 47, wherein the pH is between 9 and 10.

50. (Previously Presented) The method of claim 15, wherein the pH is greater than 10.

51. (Previously Presented) The method of claim 15, further comprising:
stripping the strontium-82 from the sodium nonatitanate.

52. (Previously Presented) The method of claim 51, wherein the strontium-82 is stripped from the sodium nonatitanate with mineral acid.

53. (Previously Presented) The method of claim 15, further comprising:
washing the sodium nonatitanate with a buffer solution.

54. (Cancelled).

55. (Previously Presented) The method of claim 15, wherein the sodium nonatitanate is

characterized by a strontium/rubidium separation factor greater than 12,500.

56. (Previously Presented) The method of claim 15, wherein the sodium nonatitanate is characterized by a strontium/rubidium separation factor greater than or equal to 59,200.

57. (Previously Presented) The method of claim 15, wherein the sodium nonatitanate is characterized by a strontium/rubidium separation factor greater than or equal to 100,000.

58. (Withdrawn) A filter comprising:

a sodium nonatitanate filter medium for receiving a rubidium-82 rich eluant from a rubidium-82 generator having strontium-82 supported on a solid substrate within the generator and trapping any strontium-82 within the eluant.

59. (Withdrawn) The filter of claim 58, further comprising:

a container for holding the sodium nonatitanate filter medium, wherein the container is in fluid communication with an outlet of the rubidium-82 generator.

60. (Withdrawn) The filter of claim 59, wherein the filter is disposable.

61. (Withdrawn) The filter of claim 58, wherein the sodium nonatitanate filter medium comprises pellets of sodium nonatitanate.

62. (Withdrawn) The filter of claim 58, wherein the sodium nonatitanate filter medium is a powder.

63. (Withdrawn) The filter of claim 58, wherein the sodium nonatitanate is characterized by a strontium selectivity greater than 250,000 mL/g at an alkaline pH.

64. (Withdrawn) The filter of claim 58, wherein the sodium nonatitanate is characterized by a rubidium selectivity less than 100 mL/g at an alkaline pH.

65. (Previously Presented) A process for preparing a rubidium-82 generator, comprising:

preparing sodium nonatitanate from titanium tetrachloride or titanium sulfate and aqueous sodium hydroxide;

heating the sodium nonatitanate at a temperature between 100°C and 250°C for a period between 12 hours and 2 weeks; and

absorbing strontium-82 on the sodium nonatitanate from an aqueous solution comprising strontium-82 and a soluble sodium salt, wherein the soluble sodium salt concentration is between 0.1 and 1 molar.

66. (Previously Presented) The process of claim 65, wherein the soluble sodium salt is sodium chloride.

67. (Previously Presented) The process of claim 65, wherein the aqueous sodium hydroxide is about 50 wt% sodium hydroxide.

68. (Previously Presented) The process of claim 65, wherein the molar ratio of aqueous sodium hydroxide to titanium tetrachloride or titanium sulfate is between about 1 and 12.

69. (Previously Presented) The process of claim 65, wherein the sodium nonatitanate is filtered from the mixture.

70. (Previously Presented) The process of claim 69, wherein the sodium nonatitanate is washed to remove sodium chloride or sodium sulfate.

71. (Previously Presented) A process for preparing a rubidium-82 generator, comprising:

(a) preparing sodium nonatitanate from titanium isopropoxide and aqueous sodium hydroxide;

(b) heating the sodium nonatitanate at a temperature between 100°C and 250°C for a period between about 12 hours and about 2 weeks; and

(c) absorbing strontium-82 on the sodium nonatitanate from an aqueous solution comprising

strontium-82 and a soluble sodium salt.

72. (Previously Presented) The process of claim 71, wherein the molar ratio of aqueous sodium hydroxide to titanium isopropoxide is in excess of 0.44.

73. (Previously Presented) The process of claim 71, wherein the molar ratio of aqueous sodium hydroxide to titanium isopropoxide is between 2 and 6.

74. (Previously Presented) The process of claim 71, wherein the aqueous sodium hydroxide is about 50 wt% sodium hydroxide.

75. (Previously Presented) The process of claim 71, wherein the soluble sodium salt concentration is between 0.1 and 1 molar.

76. (Previously Presented) The process of claim 71, further comprising:
loading the sodium nonatitanate into a column after absorbing strontium-82.

77. (Previously Presented) The process of claim 76, characterized by uniform loading of strontium-82 throughout the sodium nonatitanate.

78. (Previously Presented) The process of claim 10, wherein the solution containing strontium-82 is an acidic aqueous solution.

79. (Cancelled)

80. (Currently Amended) The rubidium-82 generator of claim [[79]] 1, wherein the separation factor is determined in an aqueous sodium chloride solution.

81. (Previously Presented) The rubidium-82 generator of claim 80, wherein the aqueous sodium chloride solution has a sodium chloride concentration from 0.001 molar to 1 molar.

82. (Previously Presented) The rubidium-82 generator of claim 80, wherein the aqueous sodium chloride solution is buffered to control acidity.

83. (Previously Presented) The rubidium-82 generator of claim 80, wherein the aqueous sodium chloride solution is unbuffered.

84. (Currently Amended) The rubidium-82 generator of claim [[79]] 1, wherein the sodium nonatitanate is characterized by a strontium selectivity greater than about 85,000 mL/g in a 0.1 molar or 1 molar aqueous sodium chloride solution.

85. (Currently Amended) The rubidium-82 generator of claim [[80]] 84, wherein the aqueous sodium chloride solution is unbuffered.

86. (Currently Amended) The rubidium-82 generator of claim [[79]] 1, wherein the sodium nonatitanate is characterized by a rubidium selectivity less than 100 mL/g in a 0.1 molar aqueous sodium chloride solution.

87. (Currently Amended) The rubidium-82 generator of claim [[80]] 86, wherein the aqueous sodium chloride solution is unbuffered.

88. (Currently Amended) The rubidium-82 generator of claim [[79]] 1, wherein the sodium nonatitanate is characterized by a strontium/rubidium separation factor greater than 10,000 in a 1 molar aqueous sodium chloride solution.

89. (Currently Amended) The rubidium-82 generator of claim [[79]] 1, wherein the sodium nonatitanate is characterized by a rubidium retention of less than 1.8 % in a 1 molar aqueous sodium chloride solution.

90. (Currently Amended) The rubidium-82 generator of claim [[79]] 1, wherein the sodium

nonatitanate is characterized by a rubidium retention of less than about 13.6 % in a 0.1 molar aqueous sodium chloride solution.

91. (Currently Amended) The rubidium-82 generator of claim [[79]] 1, wherein the sodium nonatitanate is characterized by a rubidium retention of less than about 40 % in a 0.01 molar aqueous sodium chloride solution.

92. (Currently Amended) The rubidium-82 generator of claim [[79]] 1, wherein the sodium nonatitanate is characterized by a rubidium retention of less than about 50 % in a 0.001 molar aqueous sodium chloride solution.

93. (Currently Amended) The rubidium-82 generator of claim [[79]] 1, wherein the generator contains less than 1 gram of sodium nonatitanate.

94. (Previously Presented) A process, comprising:

eluting a solution of rubidium-82 from a strontium-82 support medium comprising sodium nonatitanate with an aqueous solvent.

95. (Previously Presented) The process of claim 94, wherein the aqueous solvent is selected from the group consisting of water and saline solutions.

96. (Previously Presented) The process of claim 94, wherein the aqueous solvent has a sodium chloride concentration between 0.001 molar and 1 molar.

97. (Previously Presented) The process of claim 94, wherein the aqueous solvent has a sodium chloride concentration between 0.2 molar and 1 molar.

98. (Previously Presented) The process of claim 94, wherein the aqueous solvent is a saline and buffer solution suitable for human injection.

99.(Previously Presented) The process of claim 94, wherein the sodium nonatitanate is a reaction product of titanium isopropoxide and aqueous sodium hydroxide.

100. (Previously Presented) The process of claim 94, further comprising passing the rubidium-82 solution through a sodium nonatitanate filter to selectively remove any strontium-82 or strontium-85 from the solution.

101. (Previously Presented) The process of claim 100, further comprising disposing of the sodium nonatitanate filter.

102. (Previously Presented) The process of claim 94, further comprising using the rubidium-82 solution as a medical diagnostic agent or medical imaging agent.

103. (Previously Presented) The process of claim 94, further comprising injecting the rubidium-82 solution intravenously.

104. (Previously Presented) The process of claim 94, further comprising stripping strontium-82 from the sodium nonatitanate.

105. (Previously Presented) The process of claim 104, further comprising recovering the stripped strontium-82.

106. (Previously Presented) The process of claim 104, further comprising recycling the sodium nonatitanate.

107. (Previously Presented) The process of claim 94, wherein the sodium nonatitanate has not undergone hydrothermal treatment.

108. (Previously Presented) The rubidium-82 generator of claim 1, wherein the sodium nonatitanate has not undergone hydrothermal treatment.

109. (Previously Presented) The rubidium-82 generator of claim 5, wherein the sodium nonatitanate has not undergone hydrothermal treatment.

110. (Previously Presented) The process of claim 10, wherein the solution containing strontium-82 is an alkaline aqueous solution.